CLAIMS

What is claimed is:

1. A display driver comprising:

a plurality of display outputs each for outputting a drive voltage to a row or a column of a display; and

a plurality of configuration bits each having a row/column setting, wherein

each configuration bit is exclusively associated with one or more of said plurality of display outputs such that said row/column setting of said configuration bit is used to configure all of said associated one or more display outputs for driving either rows or columns of the display.

2. The display driver of claim 1, wherein some number of said display outputs associated with one configuration bit can be configured to drive rows of the display and another number of said display outputs associated with another configuration bit can be configured to drive columns of the display independent of each other.

3. The display driver of claim 1, wherein, when at least one display output is set to drive a row of the display, said drive voltage output by said display output is set independent of the total number of rows in the display.

4. The display driver of claim 1, wherein the display driver is adapted to drive a bistable liquid crystal display.

5. The display of claim 4, wherein said bistable liquid crystal display includes a chiral nematic liquid crystal material having a planar texture and a focal conic texture that are stable in the absence of an electric field.

6. The display driver of claim 1, wherein each display output is uniquely associated with one of the configuration bits.

7. A display driver comprising:

a plurality of driver blocks, each of said plurality of driver blocks including:

a plurality of display outputs each for outputting a drive voltage to a row or column of a display; and

a configuration bit having a row/column setting, wherein said driver block is configured to drive either rows or columns of the display according to said configuration bit row/column setting, and each of said plurality of display outputs of said driver block is thereby configured to input said drive voltage to either a row or a column of the display, respectively.

8. The display driver of claim 7, wherein some number of said plurality of driver blocks can be configured to drive rows of the display and another number of said plurality of driver blocks can be configured to drive columns of the display.

9. The display driver of claim 7, wherein, when at least one of said plurality of driver blocks is set to drive rows of the display, said drive voltage output by said display outputs of said at least one of said plurality of driver blocks is set independent of the total number of rows in the display.

10 The display driver of claim 7, wherein the display driver is adapted to drive a bistable liquid crystal display.

11. The display driver of claim 10, wherein said driver is adapted for driving a bistable liquid crystal display including a chiral nematic liquid crystal material having a planar texture and a focal conic texture that are stable in the

absence of an electric field.

12. The display driver of claim 7, wherein each of said plurality of driver blocks can be set to drive either rows or columns independently of any other driver block setting.

13. A display driver comprising:

a first driver block including:

a plurality of display outputs, each for outputting a drive voltage to either a row or a column of a display; and

a configuration bit having a row/column setting for setting said first driver block to drive either rows or columns of the display, wherein

all of said plurality of display outputs are set to drive either rows or columns of the display, respectively;

and

a second driver block including:

another plurality of display outputs, each for outputting a drive voltage to either a row or a column of the display; and

another configuration bit having a row/column setting for setting said second driver block to drive either rows or columns of the display, wherein

all of said another plurality of display outputs are set to drive either rows or columns of the display, respectively.

14. The display driver of claim 13, wherein said first and said second drive blocks can be set independently of each other to drive either rows or columns.

15. The display driver of claim 13, wherein, when at least one of said first and second driver blocks is set to drive rows of the display, said drive voltage output by said display outputs of said at least one of said first

and second driver blocks is set independent of the total number of rows in the display.

16. The display driver of claim 13, wherein the display driver is adapted to drive a bistable liquid crystal display.

17. The display driver of claim 16, wherein said display driver is adapted for driving a bistable liquid crystal display including a chiral nematic liquid crystal material having a planar texture and a focal conic texture that are stable in the absence of an electric field.

18. A display driver for driving a bistable display, said display driver comprising:

a plurality of driver blocks, each driver block including:

a plurality of display outputs, each for outputting a voltage to a row or a column of a display; and

a configuration bit having a row/column setting, wherein

all of said plurality of display outputs of said driver block are set to drive either rows or columns of the display according to said configuration bit setting, wherein

each of said plurality of driver blocks can be set independently to drive either rows or columns, and further wherein

said driver is adapted to drive a bistable display.

19. The display driver of claim 18, wherein one of said driver blocks has a certain number of display outputs, and further wherein another of said output blocks has a different number of display outputs.

20. The display driver of claim 18, wherein said configuration bits are implemented by using memory storage.

21. The display driver of claim 18, wherein each of said configuration bits is an input lead to said display driver and further wherein

said setting is set by providing a voltage and/or logic setting to said input lead.

22. The display driver of claim 18, further including a data bus input, wherein said row/column setting of said configuration bit is obtained from said data bus input.

23. The display driver of claim 18, wherein the voltage of a display output driving a row of the display driver is independent of the total number of rows in the display.

24. The display driver of claim 18, further including a cascade output and a cascade input for cascading multiple drive blocks and/or multiple display drivers together.

25. A display driver system comprising a plurality of display drivers as defined in claim 24 cascaded together, wherein said system drives the display.

26. The display driver of claim 18, wherein said display driver is adapted for driving a bistable display including a chiral nematic liquid crystal material having a planar texture and a focal conic texture that are stable in the absence of an electric field.

27. A display driver comprising:

a plurality of driver blocks, each driver block including a corresponding plurality of display outputs, each of said plurality of display outputs being effective for outputting a voltage to a row or a column of a display; and

a plurality of configuration bits equal to the number of said plurality of driver blocks, wherein

each configuration bit has a row/column setting and is associated with a corresponding driver block, and further wherein,

each driver block is set to drive either rows or columns according to said row/column setting, such that each of said corresponding plurality of display outputs of said driver block are all set for driving a row or a column, respectively, of the display.

28. A display driver for driving a display, said display driver comprising:

a plurality of driver blocks, each driver block including:

a plurality of display outputs, each for outputting a voltage to a row or a column of a display;

a configuration bit having a row/column setting;

a cascade input; and

a cascade output, wherein

all of said plurality of display outputs of said driver block are set to drive either rows or columns of the display according to said configuration bit setting,

wherein each of said plurality of driver blocks can be set independently to drive either rows or columns, and further

wherein two or more of said plurality of driver blocks can be cascaded together for driving additional rows or columns of the display by connecting a cascade input of one of said two or more driver blocks to the cascade output of another of said two or more driver blocks.

29. The display driver of claim 28, wherein a first display driver can be cascaded with a second display driver by connecting the cascade input of one of a plurality of blocks of the second display driver with the cascade output of one of a plurality of blocks of the first display driver for driving additional rows or columns of the display.

30. A display driver comprising:

a plurality of display outputs each for outputting a drive voltage to a row or a column of a display;

a configuration bit having a row/column setting;

a cascade input; and

a cascade output, wherein

the row/column setting of said configuration bit is used to configure one or more display outputs for driving either a row or a column of the display, and further wherein

a first display driver can be cascaded with a second display driver by connecting the cascade output of the first display driver with the cascade input of the second display driver for driving additional rows or columns of the display.

31. A liquid crystal display device comprising:

chiral nematic liquid crystal material;

substrates that form therebetween a region in which said liquid crystal material is disposed, wherein said substrates cooperate with said liquid crystal material to form in said region scattering focal conic and reflecting planar textures that are stable in the absence of an electric field;

electrodes disposed on said substrates effective to apply an electric field to areas of said region corresponding to a plurality of columns and rows;

wherein incident light travels in a direction through said region, comprising a light absorbing back layer disposed downstream of said region relative to said direction of incident light; and

a display driver for applying an electric field for transforming at least a portion of said liquid crystal material to at least one of the focal conic and planar textures, said display driver comprising:

a plurality of display outputs each for outputting a drive voltage to one of said rows or one of said columns; and

a plurality of configuration bits each having a row/column setting;

wherein each said configuration bit is exclusively associated with one or more of said plurality of display outputs such that said row/column setting of said configuration bit is used to configure all of said associated one or more display outputs for driving either said rows or said columns.

32. The liquid crystal display device of claim 31, wherein some number of said display outputs associated with one said configuration bit can be configured to said rows and another number of said display outputs associated with another said configuration bit can be configured to drive said columns independent of each other.

33. The liquid crystal display device of claim 31, wherein, when at least one of said display outputs is set to drive one said row, said drive voltage output by the at least one said display output is set independent of the total number of said rows in the display.

34. A reflective full color liquid crystal display device comprising:

first chiral nematic liquid crystal material comprising liquid crystal having a pitch length effective to reflect visible light of a first color, second chiral nematic liquid crystal material comprising liquid crystal having a pitch length effective to reflect visible light of a second color, and third chiral nematic liquid crystal material comprising liquid crystal having a pitch length effective to reflect visible light of a third color;

substrates that form therebetween a first region in which said first material is disposed, a second region in which said second material is disposed and a third region in which said third

material is disposed, wherein said first region, said second region and said third region are stacked relative to each other;

electrodes disposed on said substrates effective to apply an electric field to areas of said first region, said second region and said third region, corresponding to a plurality of columns and rows;

wherein said substrates cooperate with said first material, said second material and said third material to form in said first region, said second region and said third region, scattering focal conic and reflecting planar textures that are stable in the absence of an electric field;

wherein incident light travels in a direction sequentially through said first region, said second region and said third region, said first region being closest to a viewer, comprising a light absorbing back layer disposed downstream of said third region relative to said direction of incident light;

wherein the incident light is reflected by the planar textures of said first region, said second region and said third region such that reflected light leaving the display exhibits a color that is an additive mixing of combinations of said colors which are reflected from said planar textures, and said incident light passing through said first region, said second region and said third region is absorbed by said light absorbing back layer; and

a display driver for applying an electric field for transforming at least a portion of the liquid crystal of at least one of said first material, said second material and said third material, to at least one of the focal conic and planar textures, said display driver comprising:

a plurality of display outputs each for outputting a drive voltage to one of said rows or one of said columns, and

a plurality of configuration bits each having a row/column setting,

wherein each said configuration bit is exclusively associated with one or more of said plurality of display outputs such that said

row/column setting of said configuration bit is used to configure all of said associated one or more display outputs for driving either said rows or said columns;

wherein a proportion of at least one of said first material, said second material and said third material exhibits a planar texture in the absence of an electric field and a proportion of the at least one of said first material, said second material and said third material exhibits a focal conic texture in the absence of an electric field, wherein said display driver provides an electric field pulse of sufficient amplitude and duration to change the proportions of the at least one of said first material, said second material and said third material in said planar and focal conic textures, whereby the intensity of light reflected may be selectively adjusted.

35. A reflective liquid crystal display device comprising:

first chiral nematic liquid crystal material comprising liquid crystal having a pitch length effective to reflect electromagnetic radiation of a first wavelength and second chiral nematic liquid crystal material comprising liquid crystal having a pitch length effective to reflect electromagnetic radiation of a second wavelength;

substrates that form therebetween a first region in which said first material is disposed and a second region in which said second material is disposed, wherein said first region and said second region are stacked relative to each other;

electrodes disposed on said substrates effective to apply an electric field to areas of said first region and said second region, corresponding to a plurality of columns and rows;

wherein said substrates cooperate with said first material and said second material to form in said first region and said second

region, scattering focal conic and reflecting planar textures that are stable in the absence of an electric field;

wherein incident light travels in a direction sequentially through said first region and said second region, said first region being closest to a viewer, comprising a light absorbing back layer disposed downstream of said second region relative to said direction of incident light;

wherein the incident light is reflected by the planar textures of said first region and said second region such that reflected light leaving the display exhibits a wavelength that is an additive mixing of combinations of said wavelengths which are reflected from said planar textures, and said incident light passing through said first region and said second region is absorbed by said light absorbing back layer; and

a display driver for applying an electric field for transforming at least a portion of said liquid crystal material of the liquid crystal of at least one of said first material and said second material, to at least one of the focal conic and planar textures, said display driver comprising:

a plurality of display outputs each for outputting a drive voltage to one of said rows or one of said columns, and

a plurality of configuration bits each having a row/column setting,

wherein each said configuration bit is exclusively associated with one or more of said plurality of display outputs such that said row/column setting of said configuration bit is used to configure all of said associated one or more display outputs for driving either said rows or said columns;

wherein a proportion of at least one of said first material and said second material exhibits a planar texture in the absence of a field and a proportion of the at least one of said first material and said second material exhibits a focal conic texture in the absence of an electric field, wherein said display driver provides

an electric field pulse of sufficient amplitude and duration to change the proportions of the at least one of said first material and said second material in said planar and focal conic textures, whereby the intensity of light reflected may be selectively adjusted.

36. The liquid crystal display device of claim 35, wherein the liquid crystal material of one of said first material and said second material has a pitch length effective to reflect visible light and the liquid crystal of the other of said first material and said second material has a pitch length effective to reflect infrared radiation.

37. The liquid crystal display device of claim 35, wherein the liquid crystal of said first material has a pitch length effective to reflect visible light of a first color and the liquid crystal of said second material has a pitch length effective to reflect visible light of a second color.

38. A chiral nematic liquid crystal display, comprising:

chiral nematic liquid crystal material located between first and second substrates, said material including a planar texture having a circular polarization of a predetermined handedness and a focal conic texture that are stable in an absence of an electric field;

electrodes disposed on said first and second substrates effective to apply an electric field to areas of said region corresponding to a plurality of columns and rows;

a first quarter wave retarder located adjacent to said first substrate;

a linear polarizer located adjacent to said first quarter wave retarder;

a second quarter wave retarder located adjacent to said linear polarizer;

a transflector having a reflective side adjacent to said second quarter wave retarder and a light transmitting side;

a light source adjacent to said transmitting side, said light source being selectively energizeable to emit light through said transflector; and

a display driver for applying an electric field for transforming at least a portion of said liquid crystal material to at least one of the focal conic and planar textures, said display driver comprising:

a plurality of display outputs each for outputting a drive voltage to one of said rows or one of said columns; and

a plurality of configuration bits each having a row/column setting,

wherein each said configuration bit is exclusively associated with one or more of said plurality of display outputs such that said row/column setting of said configuration bit is used to configure all of said associated one or more display outputs for driving either said rows or said columns.

39. A liquid crystal display device comprising:

chiral nematic liquid crystal material;

substrates that form therebetween a region in which said liquid crystal material is disposed;

at least one alignment surface that is effective to substantially homogeneously align the liquid crystal director adjacent thereto, wherein at least one of said substrates and each said alignment surface cooperates with said liquid crystal material so as to form focal conic and planar textures that are stable in the absence of an electric field, each said alignment surface being effective to provide at least one of the following:

(a) a brightness at a wavelength of peak reflection of said planar texture that is increased by at least 5% as compared to an identical liquid crystal device but with inhomogeneous alignment surfaces,

(b) the focal conic texture with a reflectance that does not exceed 10% of electromagnetic radiation incident on the display device at a wavelength of peak reflection of the planar texture, and

(c) a degree of circular polarization at a wavelength of peak reflection of the planar texture, which is increased by at least 10% as compared to an identical liquid crystal device but with inhomogeneous alignment surfaces; and

a display driver for applying an electric field for transforming at least a portion of said liquid crystal material to at least one of the focal conic and planar textures, said display driver comprising:

a plurality of display outputs each for outputting a drive voltage to one of said rows or one of said columns; and

a plurality of configuration bits each having a row/column setting,

wherein each said configuration bit is exclusively associated with one or more of said plurality of display outputs such that said row/column setting of said configuration bit is used to configure all of said associated one or more display outputs for driving either said rows or said columns.

40. The liquid crystal display device of claim 39, wherein each said alignment surface cooperates with said material so as to be effective in increasing brightness by at least 5% at a wavelength of peak reflection of said planar texture.

41. The liquid crystal display device of claim 39, wherein each said alignment surface is effective to provide the focal conic texture with a reflectance that does not exceed 10% of electromagnetic radiation incident on the display device at a wavelength of peak reflection of the planar texture.

42. The liquid crystal display device of claim 39, wherein each said alignment surface is effective in providing the degree of circular polarization at a wavelength of peak reflection of the planar texture, which is increased by at

least 10% as compared to the identical liquid crystal device but with inhomogeneous alignment surfaces.